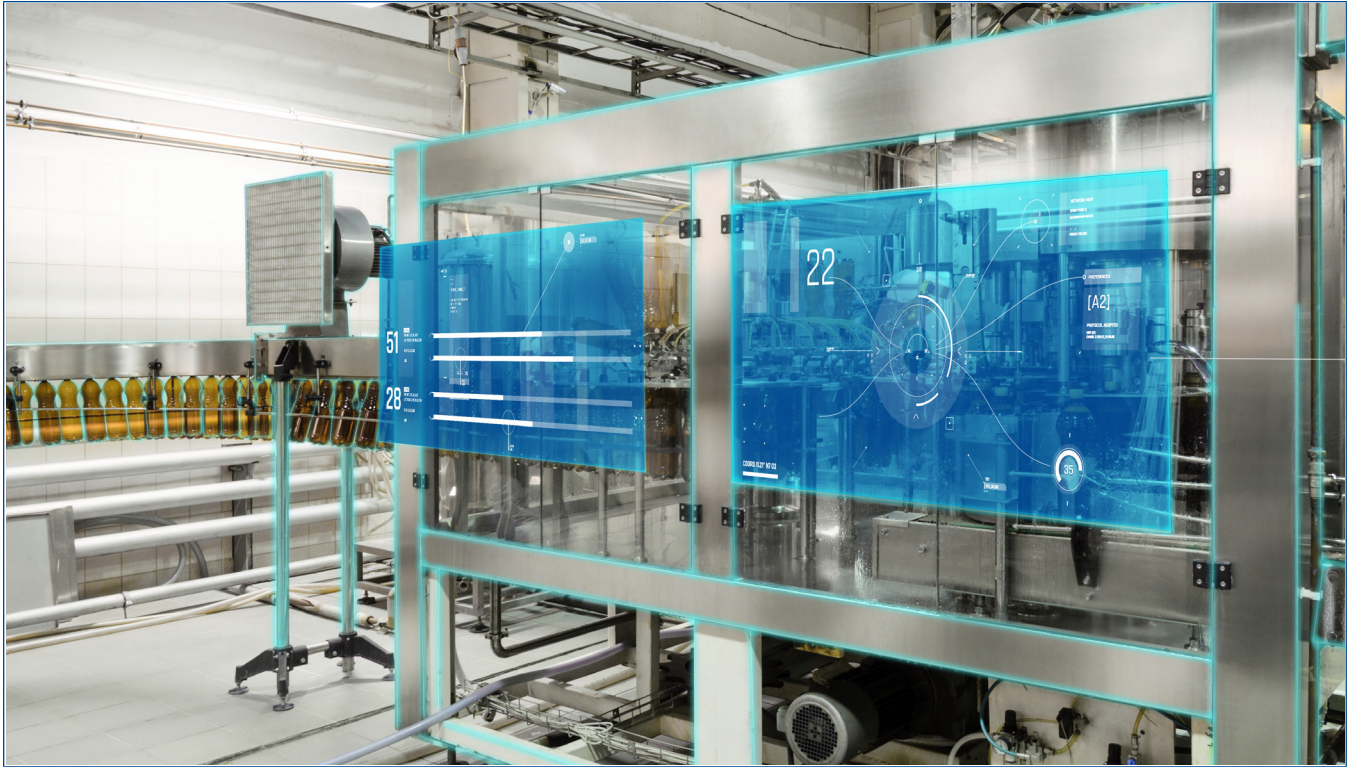


PACEdge™ Software for Edge Computing

Powerful, Secure and Simplified IIoT Development



Introduction

PACEdge™ is an IIoT application enablement platform for the development of scalable data intensive Industry 4.0 solutions. It provides integration between OT and IT domains without disrupting OT assets, architectures or systems while satisfying IT cybersecurity, communications and application requirements. It has been designed specifically to be user-friendly to both IT and OT experts. PACEdge is capable of supporting integrations and architectures ranging from IIoT gateways and remote monitoring to edge AI/ML analytics and data visualization. The PACEdge software environment provides all the tools necessary to collect, store, process, share, visualize, secure and integrate data allowing users to focus on

applications and solutions instead of tools and platforms. All components necessary in an IIoT application are brought together in a scalable, microservices based, package to decrease your development time and increase your deployable footprint.

Fast Application Development

With drag-and-drop programming, automated tag data exchange, and pre-configured time-series and SQL databases, “wiring” software and hardware interfaces has never been easier. Connect systems from the plant floor to user dashboards and beyond using an intuitive application development platform. No more command line configuration, PACEdge has web interfaces for device administration, application development and scalability.

Data Storage & Processing

Once data is collected, PACEdge can store data to both time series and relational databases. Having both options allow a developer to choose the database solution that best satisfies application needs. Once data is stored, it can be processed in several ways including mathematical analysis, statistical computation, and data analytics or processed using AI/ML models.

Effective Visualization

PACEdge provides powerful interactive tools to make analyzing data and visualizing machine operations much easier. Data can be visualized into modern looking charts and tables making it easy to interpret results. Machine operations can be represented by animated and interactive HMI visuals. With data and machine visualization available in a single environment, both users and developers will enjoy the modern visualization elements of PACEdge.

Secure Platforms & Communications

The PACEdge architecture is built with security in mind. It allows for safe desegregation of operational data and networks so they can interact with higher level IT and cloud solutions. PACEdge platform keeps only few essential networking ports open and all network traffic passes through a reverse proxy. PACEdge also secures the transmission of data by supporting the latest encryption standards. In addition, it has a centralized security center module for passwords, roles and rights management.

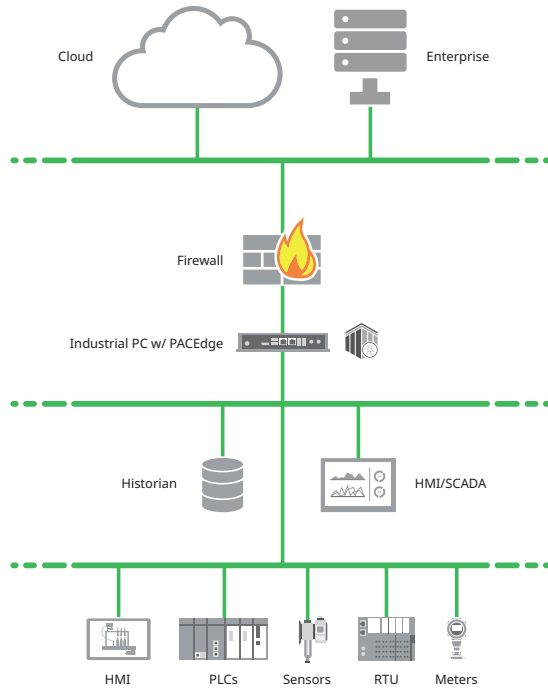
AI/ML Integration

PACEdge comes with Python/Jupyter container, which can be used to develop and execute AI/ML models. Powerful hardware, with internal GPU acceleration, results in a fast and low latency data processing. Additional plug-in accelerators and NPUs can further reduce latency and increase processing data rate. Openness and modularity of containerized PACEdge architecture allows users to easily integrate their own containers.

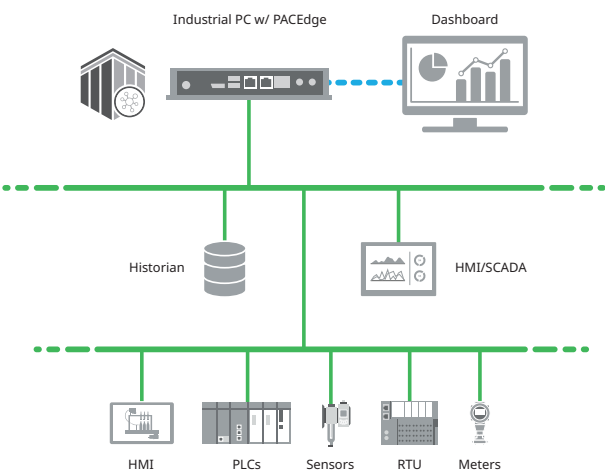
Data Collection, Distribution and Integration

PACEdge can communicate with over 20 unique proprietary or open OT protocols across multiple industry sectors. This makes collecting data from sensors and controls easier. Once the data is collected it can be shared with IT systems including enterprise and cloud systems. To do this, PACEdge can serve data via MQTT, Rest API or from its OPC Foundation Certified OPC UA Server. PACEdge also provides data routing capability with no need for scripting to route data from one source to any or multiple destinations.

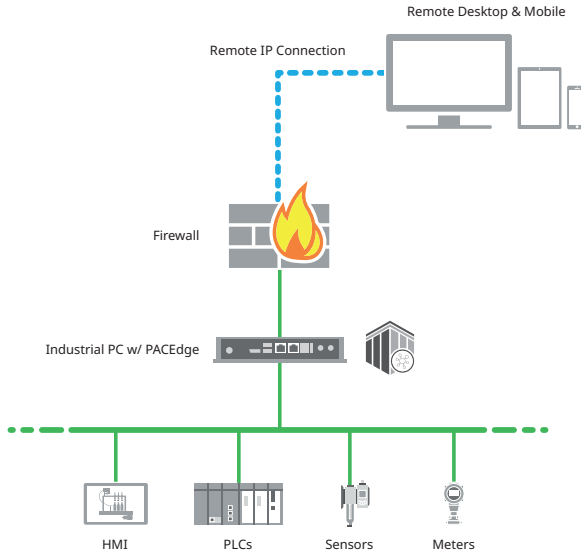
PACEdge™ IIoT Solution Architectures



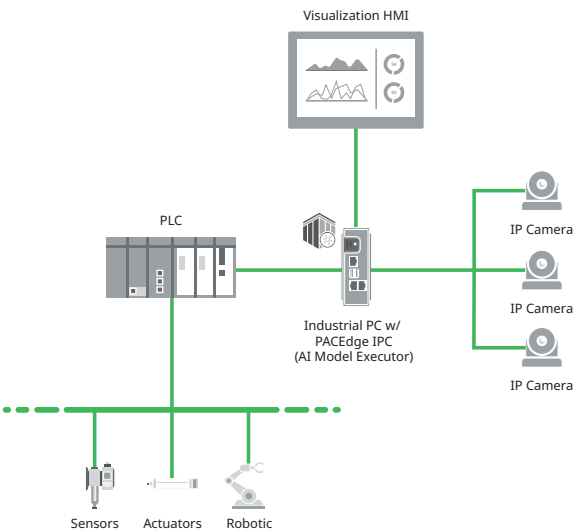
Industrial OT to Enterprise/Cloud Architecture



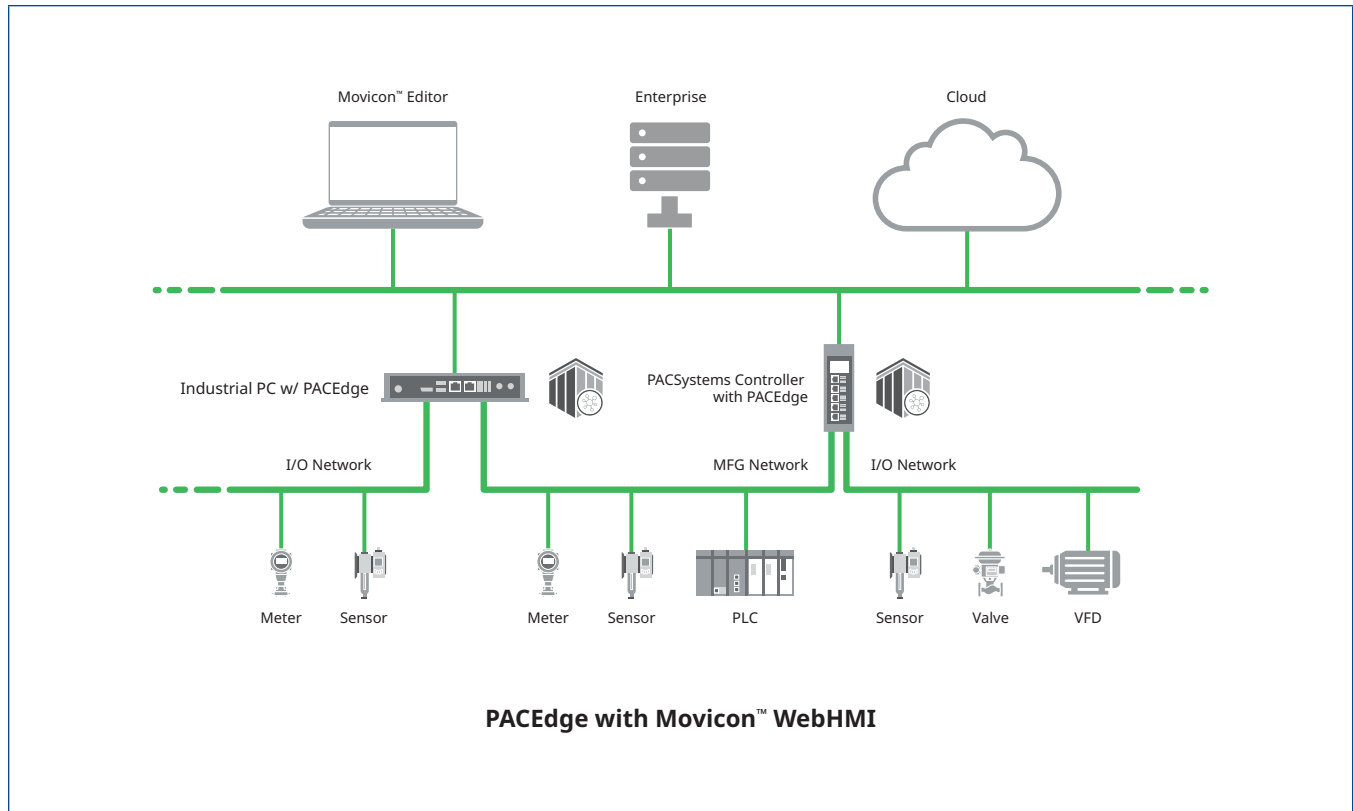
Standalone Processing & Visualization



Remote Monitoring



Quality Inspection



Scalable Software & Hardware Options

The PACEdge family of products is supported by three different software tiers available across multiple industry-leading edge computing and edge controller platforms.

This provides customers, system architects, integrators, and engineers with the flexibility they need to ensure the software capabilities and hardware architecture meet the requirements of the solution.

PACEdge™ Family of Software Options

PACEdge™

PACEdge software combines data collection, storage, processing and visualization into a single environment for the rapid development and deployment of IIoT applications. PACEdge software is ideal for developers familiar with common software tools such as Grafana, Docker, Python and Node-RED, and only requires standard open OT & IT protocols for data collection and integration along with basic data visualization and dashboarding.

PACEdge + Connex – Option

The PACEdge platform with Connex™ software combines the core capabilities of PACEdge with additional OT and IT protocol and integration support. Connex brings with it support for over 20 additional open, legacy and proprietary protocols, an OPC Foundation Certified OPC UA Client and industry-leading I/O Data Server. The additional connectivity and integration capabilities of Connex increases the deployable footprint of an IIoT application. Connex also serves as a data router, accepting data over one protocol and routing it to other protocols, databases, or standards-based interfaces.

PACEdge + Movicon™ WebHMI – Option

The PACEdge platform with the Movicon™ WebHMI software option combines the core capabilities of PACEdge and Connex with OT-familiar HMI visualization for your IIoT applications. WebHMI is a web-based HMI visualization tool that uses both HTML5 and SVG technology to render real-time data, historical trends, machine animations and operator feedback in both desktop and mobile environments.

PACEdge + Group Manager – Option

The PACEdge platform with a Group Management software option enables users to facilitate OS orchestration and updates, update the PACEdge version, update Node Red and Grafana content without having to access each individual device. Group Manager as a service enables the user to manage up to 10, 50, 100, 250 or 500 PACEdge devices securely from a single parent PACEdge device.

Edge Computing and Edge Controllers

	Edge Computing		Edge Controllers	
Product Line	2000 Series IPC	6000/7000/8000 Series IPC	CPE400	CPL410
Description	2000 Series IPC delivers impressive performance in a compact budget	The 6000/7000/8000 Series IPC delivers compact, rugged, mid-to-high range performance computing capabilities	The CPE400 and CPL410 Edge Controller family augments real-time control with embedded PACEdge™ technology	
Target IIoT Solution Architectures	■ Edge Gateway ■ Edge-to-Enterprise Processing ■ Standalone Processing & Visualization ■ Remote Monitoring	■ Edge Gateway ■ Edge-to-Enterprise Processing ■ Standalone Processing & Visualization ■ Remote Monitoring ■ AI/ML Algorithm Execution	■ Edge Gateway ■ Edge-to-Enterprise Processing ■ Standalone Processing & Visualization ■ Remote Monitoring	■ Edge Gateway ■ Edge-to-Enterprise Processing ■ Standalone Processing & Visualization ■ Remote Monitoring
PACEdge Software Options	■ PACEdge ■ PACEdge + Movicon™ WebHMI	■ PACEdge ■ PACEdge + Movicon WebHMI	■ PACEdge + Connex	■ PACEdge + Movicon WebHMI

Key IIoT Development Tools Included with PACEdge

PACEdge is a world-class IIoT development platform that helps users rapidly build IIoT applications. Some of the most critical software components include:

Tool	Description
Machine Visualization & HMI: 	- Web-based HMI visualization tool - Supports both HTML5 and SVG technology - Renders real-time data, historical trends, machine animations and operator feedback in both desktop and mobile environments - Includes Connex OT Protocol Management & I/O Data Server
OT Protocol Management & I/O Data Server: 	- Industrial protocol communication management and I/O Data Server for simplifying integration with OT devices, sensors and controls - Supports for over 20 open and proprietary protocols - OPC UA Server & OPC Foundation Certified Client - Current Linux/.NET protocol drivers: Software Experience Hub – Connex Drivers
Data Processing & Flow Control: 	- Suitable for both experts and novices. Node-RED flows can be completely created in a web-based graphical environment, while experts can use function nodes and Python nodes to write their own code in Python or JavaScript - Abstracts and provides ready-to-use function blocks so that developers can focus on applications and not on mechanics
Data Visualization: 	- Analytics and interactive data visualization and dashboarding - Charts, graphs and alerts
Time Series Database: 	Time series database for the storage and retrieval of time series data with Node-RED
Time Series & Relational Database: 	Next-Gen Database for use with either tasks requiring time series data or relational data. For use with Node Red, Connex, or Python
Jupyter/Python: 	Flexible programming environment and AI/ML model execution
Docker Container Manager: 	Visual management of Docker Containers (logs, terminal into container, statistics, control of container)
Operating System: 	PACEdge uses an LTS aligned Linux operating system and provides quarterly security releases to their customers

Ordering Information

Part Number	Description	Details
CPE400/CPL410 Edge Controller		
IC695CPE400	RX3i Rackless CPU 64MB + PACEdge+Connex	PACSystems CPE400 Rackless CPU, 64MB User Memory, 6 Ethernet Ports, 1 RS-232 port, with PACEdge + Connex software, mounting plates
IC695CPL410	RX3i Rackless CPU 64MB + PACEdge+WebHMI	PACSystems CPL410 Rackless CPU, 64MB User Memory, 6 Ethernet Ports, 1 RS-232 port, with PACEdge + WebHMI software, mounting plates
2000 Series Industrial PC (IPC)		
UIPCA21E2HE0A	UIPC, DC, 2GB, 64GB, PACEdge	2010 Industrial PC (IPC) w/ PACEdge. The Micro iPC has a dual-core 1.2GHz processor, 2GB RAM, 64G SSD, -20°C to 70°C temp range & Integral DIN Mounting
UIPCA21E2HW0A	UIPC, DC, 2GB, 64GB, PACEdge + WebHMI	2010 Industrial PC (IPC) w/ PACEdge, Movicon Connex & WebHMI. Movicon license includes the Automation Driver Pack, Basic Driver Pack, & 2k OPC UA Tags. The Micro iPC has a dual-core 1.2GHz processor, 2GB RAM, 64G SSD, -20°C to 70°C temp range & Integral DIN Mounting
UIPCD41E2HE0A	UIPC, QC, 4GB, 64GB, PACEdge	2010 Industrial PC (IPC) w/ PACEdge. The Micro IPC has a quad-core 1.2GHz processor, 4GB RAM, 64G SSD, -20°C to 70°C temp range & Integral DIN Mounting
UIPCD41E2HW0A	UIPC, QC, 4GB, 64GB, PACEdge + WebHMI	2010 Industrial PC (IPC) w/ PACEdge, Movicon Connex & WebHMI. Movicon license includes the Automation Driver Pack, Basic Driver Pack, & 2k OPC UA Tags. The Micro IPC has a quad-core 1.2GHz processor, 4GB RAM, 64G SSD, -20°C to 70°C temp range & Integral DIN Mounting
6000/7000/8000 Series Industrial PC (IPC)		
RPB6A1N2E0N0A	IPC6010, PACEdge, 5C, 4GB RAM, 128GB SSD, ST	6010 Industrial PC (IPC), U300E, 4GB LPDDR5, 128GB SSD, PACEdge, 0°C up to 70°C
RPB6A1N2W0N0A	IPC6010, PACEdge+WebHMI, 5C, 4GB RAM, 128GB SSD, ST	6010 Industrial PC (IPC), U300E, 4GB LPDDR5, 128GB SSD, PACEdge with Connex and WebHMI, 0°C up to 70°C
RPB6B2N3E0N0A	IPC6010, PACEdge, 6C, 8GB RAM, 256GB SSD, ST	6010 Industrial PC (IPC), i3-1315UE, 8GB LPDDR5, 256GB SSD, PACEdge, 0°C up to 70°C
RPB6B2N3W0N0A	IPC6010, PACEdge+WebHMI, 6C, 8GB RAM, 256GB SSD, ST	6010 Industrial PC (IPC), i3-1315UE, 8GB LPDDR5, 256GB SSD, PACEdge with Connex and WebHMI, 0°C up to 70°C
RPB6G2N3E0N0F	IPC6010, PACEdge, 6C, 8GB RAM, 256GB SSD, ET	6010 Industrial PC (IPC), i3-1315URE, 8GB LPDDR5, 256GB SSD, PACEdge, -40°C up to 70°C
RPB6G2N3W0N0F	IPC6010, PACEdge+WebHMI, 6C, 8GB RAM, 256GB SSD, ET	6010 Industrial PC (IPC), i3-1315URE, 8GB LPDDR5, 256GB SSD, PACEdge with Connex and WebHMI, -40°C up to 70°C

Part Number	Description	Details
RPB7P3N3E0N0F	IPC7010, PACEdge, 12C, 16GB RAM, 256GB SSD, ET	7010 Industrial PC (IPC), i5-1350PRE, 16GB LPDDR5, 256GB SSD, PACEdge, -40°C up to 70°C
RPB7P3N3W0N0F	IPC7010, PACEdge+WebHMI, 12C, 16GB RAM, 256GB SSD, ET	7010 Industrial PC (IPC), i5-1350PRE, 16GB LPDDR5, 256GB SSD, PACEdge with Connex and WebHMI, -40°C up to 70°C
RPB8W5N4E0N0F	IPC8010, PACEdge, 20C, 64GB RAM, 512GB SSD, ET	8010 Industrial PC (IPC), i7-13800HRE, 64GB LPDDR5, 512GB SSD, PACEdge, -40°C up to 70°C
RPB8W5N4W0N0F	IPC8010, PACEdge+WebHMI, 20C, 64GB RAM, 512GB SSD, ET	8010 Industrial PC (IPC), i7-13800HRE, 64GB LPDDR5, 512GB, PACEdge with Connex and WebHMI, -40°C up to 70°C
6000/8000 Series Industrial PC (IPC), PACEdge with Group Manager		
RPB6B2N3R0N0A	IPC6010, PACEdge-GM10, 6C, 8GB RAM, 256GB SSD, ST	6010 Industrial PC (IPC), i3-1315UE, 8GB LPDDR5, 256GB SSD, PACEdge with Group Manager (10 devices), 0°C up to 70°C
RPB6B2N3S0N0A	IPC6010, PACEdge-GM50, 6C, 8GB RAM, 256GB SSD, ST	6010 Industrial PC (IPC), i3-1315UE, 8GB LPDDR5, 256GB SSD, PACEdge with Group Manager (50 devices), 0°C up to 70°C
RPB6B2N3T0N0A	IPC6010, PACEdge-GM100, 6C, 8GB RAM, 256GB SSD, ST	6010 Industrial PC (IPC), i3-1315UE, 8GB LPDDR5, 256GB SSD, PACEdge with Group Manager (100 devices), 0°C up to 70°C
RPB8W5N4R0N0F	IPC8010, PACEdge-GM10, 20C, 64GB RAM, 512GB SSD, ET	8010 Industrial PC (IPC), i7-13800HRE, 64GB LPDDR5, 512GB SSD, PACEdge with Group Manager (10 devices), -40°C up to 70°C
RPB8W5N4S0N0F	IPC8010, PACEdge-GM50, 20C, 64GB RAM, 512GB SSD, ET	8010 Industrial PC (IPC), i7-13800HRE, 64GB LPDDR5, 512GB SSD, PACEdge with Group Manager (50 devices), -40°C up to 70°C
RPB8W5N4T0N0F	IPC8010, PACEdge-GM100, 20C, 64GB RAM, 512GB SSD, ET	8010 Industrial PC (IPC), i7-13800HRE, 64GB LPDDR5, 512GB SSD, PACEdge with Group Manager (100 devices), -40°C up to 70°C
Virtual Machines		
PACEDGE_VM_STANDARD	PACEDGE VM + NO HARDWARE	Provides a Virtual Machine of the PACEdge experience. VM requires 4GB RAM, and 64GB SSD space
PACEDGE_VM_HMI	PACEDGE VM + WEBHMI + NO HARDWARE	Provides a Virtual Machine of the PACEdge experience + Movicon WebHMI. Movicon license includes the Automation Driver Pack, Basic Driver Pack, & 2k OPC UA Tags. VM requires 8GB RAM, and 64GB SSD space
PACEDGE_VM_GM_100	PACEDGE VM + GM 100 + NO HARDWARE	Provides a Virtual Machine of the PACEdge experience + Group Manager 100 Devices. VM requires 8GB RAM, and 64GB SSD space

Part Number	Description	Details
Upgrades		
UPGRADE_PACEDGE_LPBP	Upgrade IPC HW to PACEdge	Upgrade IPC hardware to add a PACEdge
UPGRADE_WEBHMI_BP	Upgrade PACEdge to WebHMI	Upgrade a PACEdge to add Movicon Connex & WebHMI. The Movicon license will include 3 drivers, the Automation Driver Pack, Basic Driver Pack & 2k OPC UA Tags. The IPC must already be licensed for the latest release of PACEdge software
IC695ACCTP0	PACEdge WebHMI Add Telemetry Protocol	Upgrade a PACEdge WebHMI to add Telemetry Protocol Pack and Multi Drivers Upgrade Kit with 6 drivers
IC695ACCFP0	PACEdge WebHMI Add Facilities Protocol	Upgrade a PACEdge WebHMI to add Facilities Protocol Pack and Multi Drivers Upgrade Kit with 6 drivers
IC695ACCMD0	PACEdge WebHMI Add 6 Driver Option	Upgrade a PACEdge WebHMI to add Multi Drivers Upgrade Kit with 6 drivers
UPGRADE_PE_TO_GM10	Upgrade PACEdge to add GM10	Upgrade PACEdge to add GroupManager 10 devices
UPGRADE_PE_GM10_TO_50	Upgrade PACEdge from GM10 to GM50	Upgrade PACEdge GroupManager from 10 to 50 devices
UPGRADE_PE_GM50_TO_100	Upgrade PACEdge from GM50 to GM100	Upgrade PACEdge GroupManager from 50 to 100 devices

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